



Michigan Magnetics

Energy Conservation Approaches for an Older Building

Description

Michigan Magnetics is a magnetic tape head design and manufacturing facility located in Vermontville, Michigan. Their manufacturing facility was originally constructed in 1954, with additions in 1960, 1961 and 1984. This company, like many others in Michigan, has had to confront many challenges in incorporating their current building needs into an older building. Addressing the issues of energy use and efficiency add to the difficulty. Buildings constructed prior to 1980 did not have the insulation levels, energy efficient windows or efficient heating and cooling systems of present day construction. Michigan Magnetics has successfully addressed energy use and energy efficiency in their building under the direction of Tom Weigel, the plant engineer & safety director, by taking the following measures:

Energy Conservation Methods

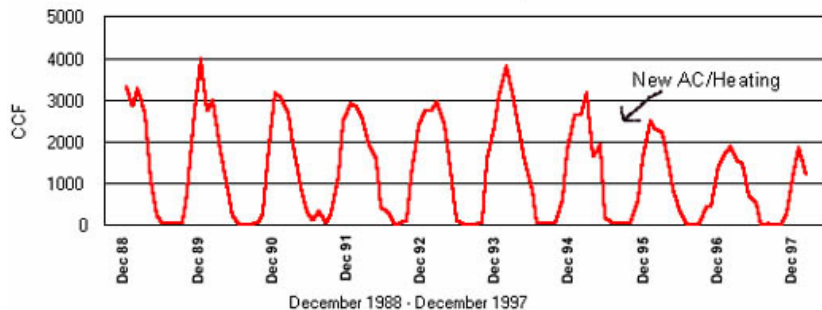
- In 1989, three gas furnaces (87% AFUE) servicing the office areas were installed replacing the existing hot water heat. These furnaces are currently being replaced with 96% efficient condensing furnaces
- In 1995, the original plant heating and cooling system was replaced. The original system was comprised of a gas boiler and a 500,000 BTU and 15 ton cooling air handler unit for the main plant. The old air handler was extremely inefficient and drew in 100% outside air.
- The replacement system consists of a new 500,000 BTU air handler for the main plant (which draws 70% of its air from the plant and 30% outside make-up air) and four 96% energy efficient condensing furnaces ranging in output from 75,000 to 125,000 BTUs with split system air conditioning ranging from 2 to 5 tons in capacity.
- Each furnace is controlled by its own programmable thermostat. The building is kept at 70 degrees during the heating season and setback to 68 degrees in the evening and weekend. During the summer, the set point is 72 degrees and the air conditioning is shut-off during the evening and weekends. Wide temperature fluctuations are not allowed due to the sensitivity of the manufacturing process.
- The lighting for the facility is energy efficient T-8 fluorescent tubes with electronic ballasts. These lights were installed in 1992 and use 92 fewer watts per fixture than the original T-12 tubes with magnetic ballasts.
- In 1987 the roof was re-sealed, coated and three inches of additional roof insulation was added. This aluminum coating is re-applied every 3 years to seal and protect the roof. It reflects 80% of the heat rays of the sun and decreases the building's cooling load.
- The business uses an efficient natural gas hot water heater and a 5 gallon electric hot water heater which is located adjacent to its point of use.
- The windows of the building are single-pane glass in aluminum frames. The business has determined that window replacement would not be economical. They have found a solution by making their own storm windows which they install themselves in the fall.
- The business uses the windows in the summer to provide for natural cooling.
- The building envelope was inspected in 1991 and the cracks associated with normal building aging were sealed to reduce air infiltration. The windows were caulked and many panes of glass were replaced. A coat of block sealer and filler paint was then applied over the entire building to reduce air infiltration.

Energy Savings

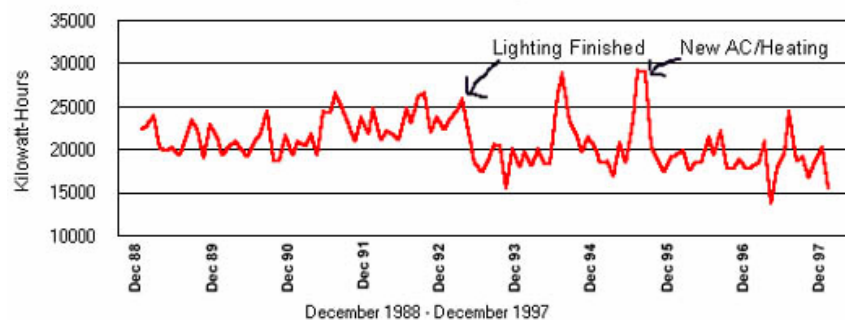
The area of the building is 23,476 square feet. The energy consumption for the past nine years is shown on the following charts. The average yearly natural gas usage prior to the installation of a new heating and cooling system was 16,543 ccf. The yearly average subsequent to this installation has been 11,307 ccf, an annual savings of approximately 5,300 ccf.

The average monthly electric usage prior to the installation of the new lighting was 22,018 kWh. After the lighting was installed, this monthly average dropped to 21,107 kWh. This equates to nearly 11,000 kWh saved per year. After the new heating and cooling systems were installed, the monthly electric usage dropped to an average of 18,667 kWh. An additional 29,280 kilowatt-hours are being saved per year due to the improved efficiency in the heating and cooling systems! This decrease in energy usage has occurred with an increase in the plant floor area that is air conditioned and an increase in production.

Natural Gas Usage



Electric Usage



For more information regarding this particular Energy Project contact:

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